

# TECTONICON

SEVERAL NEW INVENTIONS

The best measuring and speedy reckoning  
all manner of Land; Squares, Timber, Stone, Sca-  
ples, Pillers, Globes, &c. Furthermore declaring  
the perfect making and large use of the Carpenters Ruler,  
containing a Quadrant Geometrical comprehending also  
the true use of the Square. And in the end a little Treatise adjoining,  
opening the composition and appliancy of an Instrument called  
the Profitable Staffe: With other things pleasant and necessa-  
ry, most conducing for Surveyors, Land-masters, Joy-  
ners, Carpenters, and Masons.

Published by LEONARD DODDERS Gentleman, in  
the year of our Lord, 1556.



LONDON,  
Imprinted by Richard Hodgkinsonne.  
1556.

*Handwritten signature or note, possibly 'G. B. G. 1556'.*

# TECTONICON

EXETER SHREWING

The exact measuring and speedily recording  
all manner of Land, Spices, Timber, Trees, Grass,  
Plots, Polders, Globes, &c. Furthermore declaring  
the parties making and large use of the Cartographer's  
to the King's Chamber, Geometrical Surveyors, and  
the Surveyors of the Towns, and in the Court of the Admiralty  
and in the Court of the Common Pleas, and in the Court of the  
Common Bench, and in the Court of the Exchequer, and in the  
Court of the King's Bench, and in the Court of the Common Pleas,  
the Court of the Admiralty, and in the Court of the Common Pleas,  
the Court of the Admiralty, and in the Court of the Common Pleas,  
the Court of the Admiralty, and in the Court of the Common Pleas,



By Appointment to His Majesty King George the Fourth  
Surveyor General of the Land Revenue

*It is*

*that the said Surveyor General*  
*of the Land Revenue*

Printed by T. Cadell & W. Davies, Stationers, in Strand, London.  
1826.



Ch. Butler D. To the Reader.



**A**lthough (gentle Reader) many excellent in Science, upon infallible grounds, have got forth divers most certain and sufficient rules, touching the measuring of all manner Superficies: yet in that the Art of numbering hath been required, yet chiefly those rules hid, and as it were locked up in strange tongues, they did profit (or have furthered) very little the most part: Carpenters nothing at all, the Land-measure, Carpenter, Mason, wanting the aforesaid. For their sakes I am here provoked not to hide, but to open, and so increase the Talent which I have received: yea to publish in this our Tongue very shortly (if God give life) a volume containing the flowers of the Sciences Mathematical, largely applied to outward practise, profitably pleasant to all manner of men in this Realm. In the mean time I shall desire the Artificers above named, to be contented with this little Book (a taste of my good will towards them) which I wish even so to further the Readers, as I know it sufficient for the true measuring and ready account of all manner Lands, Timber, Stone, Board, Glasse, Pavements, &c.

Here mine advise shall be to those Artificers: that will profit in this, or any of my Books now published, or that hereafter shall be first carefully to read them through, then with more judgement. Read on the third reading, wittily to practise: So few things shall be unknown. Note, oft diligent reading, joyed with ingenious practise, gaineth profitable labour.

Thus most heartily farewell (loving Reader) to whom I wish my self present, to further my desire and practise in these.

*The Preface, or Content of this little Book, and  
in what it exceedeth all other published*

Ther Books before put forth in our English tongue, contained only the bare measuring of Land, Timber, and Board: how agreeable in all places to the rules of Geometry, let the learned judge. Here (gentle Reader thou shalt plainly perceive through diligent reading how to measure truly, and very speedily all manner of Land, Timber, Stone, Steeples, Pillers, Globes, Board, Glasse, Pavement, &c. without any trouble: not painted with many rules, or obscure termes, nor yet with the multitude of tables, as heretofore hath been: in which not a few errors were committed: for that cause no just account might any way bee had. Further yee shall by this Book understand the whole making and comely handling of the Carpenters Ruler, with the true measure, &c. And his use appointed to the ready measuring of all kinde of Timber, Stone, Board, &c. Also the levelling of grounds, and taking of heights, is pleasantly and diversly practised by the Ruler. Yee have here not the common, but the rare use of the Square, applied to heights, lengths, &c. And to the finding of the just houre of the day divers waies, through the aid of pleasant Tables newly adjoynd to my generall Prognostication: by the which the proportion of things, direct or squirewise standing, are by their shadows knowne.

To conclude, in the end of this Book is added a Treatise, showing the making, and use of an Instrument, by which yee shall get lengths, heights, breadths, widenesses, where or howsoever they stand. Other necessary things are contained in this little volume, which I

commit to the diligent

READER.

2 A

Divers.





# Divers things conducing to the Art of measuring.

## The i. Chapter.



As there are few Craftsmen which have all the kindes of Arithmetick ready: I doe suppose none so ignorant, but that they doe so may easily perceive the simple significations of these Characters Figures, 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. And also their strength in the first, second, and third places.

Besides that, they must be familiar with these and such like fractions. The first, lessward betwixt one second part of an whole, be it Pearch, Inch, or any other measure: the next one third, then one seventh part: the other ensuing one sixteenth. So one thirty and two parts of an Inch. Then followeth the fourths, fourth fifths. The last to nine tenths of an Inch: that is, nine parts of an Inch; which into ten portions. These I doe intend to put in my examples, and in my Tables and margins following, to represent parts of Pearch, or Inches. As if I would write half an Inch, after

Characters  
numeriall.

Fractions.

# The Art of

this manner. Three quarters of an inch thus. One eight of a Bearch, on this side. So of the rest.

It is likewise also here to open what a Bearch, a Day, work, a Rod, and an Acre is.

Although there be divers opinions engendred through long customs in many places, of the length of a bearch (upon which our chief matter dependeth) yet there is but one true bearch by statute appointed to measure by. Whererein is ordained this Beare, coine by and round to make an Inch: twelve Inches, a Foot: three Foot a Yard: five Yards,

a Bearch: foytie Bearches in length and four in breadth, an Acre. So an Acre by statute ought to contain 160. Bearches: the half Acre 80. Bearches: a Rod, commonly called a quarter, 40. Bearches: a Day-work 4 Bearches. See here the Acre expressed with his length and breadth.

	Acre.	
1	160	Length.
2	80	
4	40	
5	32	
8	20	
16	10	Breadth.

Instruments to  
measure with  
Poles.  
Cord knotted.  
Profitable  
Staffe.

I must not omit here to tell you what thing is meetest to measure land with. Wher use commonly in the Country two Poles, either of them the length of a Bearch. They are very good: yet for all kinde of lande, a Cord five Bearches in length, well leaved with wax and rosin, knotted or marked at the end of every Bearch, is more meet and readier. But in my fantasye, the Instrument Geometricall, which is put forth in the end of this Book, passeth them all and other, for the exact truth and quickness: for this Instrument is so generall and available to so sundry things, that it alow requireth a large booke, if it should be sufficiently set forth.

Triangle.

Line filling  
Squirewise.

Also I would not have you ignorant what peice of land is called a Triangle, which often hereafter shall be named. It is such a fashioned piece as hath (poorely imagined to have) three sides, and three Angles only: whether the sides be equall or otherwise, as this figure sheweth. Again, note that a line is said to fall squarewise when it cutteth any thing or any of a Triangle full corner, like unto a Square. As the hanging picked

# measuring of Land.

2

pycked line a. b. in c. d. the base  
line of the  $\Delta$  triangle: Doe it cut  
teth the side squierwise, b. fall  
cross in the point b. and not as  
the other line a. c. doth. The base  
of any triangle is here called that  
line which is the southeyle of  
the hanging line.

Concerning a Circle, know that the compass of any circle  
is named a Circumference. The middle point is the  
Center: the right line a. i. that goeth  
overthwart that Center touching  
the circumference on both sides is  
his Diameter: the half of that line,  
the Semidiameter. Also an Arch is  
a peice of the Circumference cut a-  
way: as ye see the Arch above the line  
f. g. Also f. g. h. i. in this Circle are  
named parallels: for that they differ equally in all places, the  
one from the other.

Note, because pyckie and experience sheweth me, that there  
is no land, but it may easily be brought by imagination  
to a triangle or triangles, and so most truly measured: there-  
fore, to be short, this order shall be taken: I will first figure  
and set before your eyes triangled land, another which by  
imaginations shall be brought into triangles. Then I shall  
teach the true measuring of them: I mean how to finde a  
length and breadth, with which ye shall enter the table of ac-  
count following, where the Acres and odd Peaces (if there  
be any) shall appear. As these figures are measured, so all  
triangled land, and other brought into Triangles, of what  
fashion so ever they be, shall be measured. And because it is  
quicke so; true measuring of all Triangles, to finde a straight  
hanging line, I shall shew first how that line is to be found,  
imagined, or drawn.

Base line.

Circle.  
Circumference.  
Center.

Diameter.  
Semidiameter.

Arch.

Parallel.

How



## How to measure all manner of

triangled Land.



If thou be an Arithmetician, multiply this straight hanging line, by two, as above is shew-  
ed, in half the number of peaches of that line,  
which it cutteth squrewise. For want of the  
knowledge, take the aforesaid peaches (I  
mean of the hanging line, and half the side  
which he cutteth) and with that length and breadth enter your  
table of account, as there is set forth: So shall ye perceive the  
number of Acres, Rods, Day-works.

Euclid the 1;  
Book 41. pro.

### Example

**F**or the perfect measuring of Triangles afoze figured, and  
all other, suppose the second of these last nine figures of the  
other side, having written above it *a. b. c. d.* to be a peece of  
land, whereof I would have the true measure; I know by a  
cord, otherwise, the pricked hanging line *a. b.* to be 23  
peaches: the side *b. c.* which it cutteth squrewise 11 peaches,  
whose half is 11. With these 2. and 11. the convenient  
length and breadth, I enter the table of account. Where  
I finde by that table at the corner where both the lines of con-  
venient length and breadth doe meet 3. Acres, 6. Day-works,  
and two peaches to be in that Triangle. Thus of all befoze  
figured.

Here note your table must ever be entered with all the  
peaches of the hanging line, and with half the side that he  
cutteth squrewise. With the half hanging line, and the  
whole side cut.

This Table  
followeth.



# The Art of Surveying

A figure of a double Triangle.

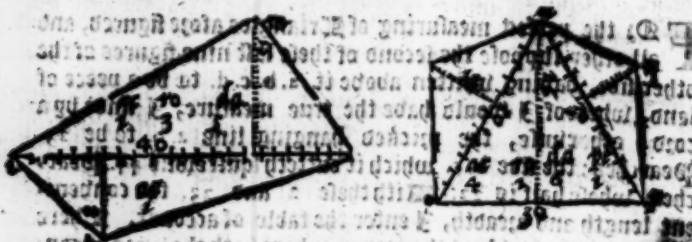
**T**his figure e. f. g. h. is but two Triangles : and therefore measured as above in two parts. **O**; thus : The hanging line e. g. is 33. Pearches : the side f. h. that he cutteth squarewise 20. Pearches, the half of the which is 10. **S**o enter your table as before with 33. and 10. the content length and breadth. **S**o shall you find the Acres, the Days, and the Pearches, the true content of this figure e. f. g. h. which is 10. Acres, 3. Days, and 10. Pearches.



Another Example.

Figures of many Angles.

**A** double triangle, it must be brought by imagination, as I have said, into a triangle or triangles. Which imagination is here signified by the line dashed a. l. Then as above is de-



clared, it ought to be measured (according to the rule of triangles) in two parts, because there are two triangles in that land. So by proof ye shall find in the upper, 1. 1. one Acre, 3. Rods, and five Day-works : in the other, 1. 1. one Acre, 3. Rods, and five Day-works. Thus together the whole content of that land, is 2. 2. two Acres, three Rods, and five Day-works.

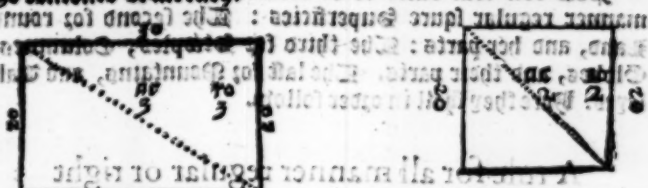
# measuring of Land.

4

Done otherwise of the adjoyned, n. o. p. q. and all other figures following; and other whatsoever they are, that by any means may be brought into triangles.

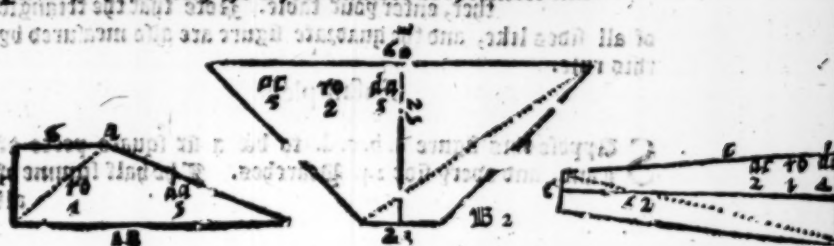
Furthermoze know that the figure i. k. l. m. is readily thus measured. Add the pearches of both the hanging lines together, as  $13 + 17 = 30$ , multiply this number, and with half the breadth of the side  $11$ , which is  $5.5$ , multiply, and with  $30$  pearches, enter your table. So is found as aforesaid.

These two figures following may also be thus measured, otherwise then by the rule of Triangles. Enter your table with their convenient length and breadth, and you shall have the contents of all such.



These three figures following, although they may be measured by the rule of Triangles, yet for quicker speed, they have also their proper measuring as ensueth.

Lay together the two sides which are parallels of the first figure: that is  $6 + 18$  making  $24$ , the half is  $12$ , the breadth  $5$ . Enter with  $5$ , and  $12$  your table. So have you one roode, and  $5$  bar, and  $10$ . For the other two  $6$  c. and such like, join the heads or ends in one, and enter your table with half of those pearches, and with the whole number of the middle line.



# The Art of

## How by supputation to measure all triangled Land.

To measure  
triangled Land  
by supputation.

**I** Join all the sides together: take half out of that half, pull  
there side, noting the difference. Then multiply the dif-  
ferences the one in the other, and the third difference ang-  
ment in the product. That which increaseth, multiply in the  
half of all the sides joyned. Then the Radix of the surmount-  
ing square is the content of that Triangle.

Four rules  
following.

Now rest four rules to be treated of. The first for all  
manner regular square Superficies: The second for round  
Land, and her parts: The third for Stemples, Columns,  
Globes, and their parts. The last for Mountains, and Wal-  
leys. Here they shall in order follow.

### A rule for all manner regular or right squared Land of many sides, as

5.6.7.8.9.10.20.100.&c.

#### The.iii. Chapter.

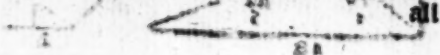
To measure  
land of many  
sides.



**M**asure and lay all the sides together, taking the  
half number of Peaches there contained.  
Then draw a right hanging line from the Cen-  
ter or midst of that figure, or the midst of  
some one side, and with that length and the o-  
ther, enter your table. Note that the triangle  
of all sides like, and the quadrate figure are also measured by  
this rule.

#### Example.

**S**uppose this figure a. b. c. d. to be a six square peete of  
Land, and every side 24. Peaches. The half square of all





Suppose a piece of land, whereof the compass is 100. Pea-  
ches, the breadth 32. Peaches. I would know how much  
the land will contain. When you shall with half the com-  
pass, that is 50. and with half the breadth, that is 16.  
in the Table I cannot finde 50 for the  
greatest length is 40. (therefore I en-  
ter with 40. and 16. So is found four  
Acres. Then I enter again with 16.  
Peaches remaining, and 16. the breadth  
as before, that bringing 1. Acre. Now  
to conclude my addition of 1. and 4. I finde the Acres in that  
round land, whose half compass is 50. Peaches, and the  
breadth 16. Peaches.



### How parts of Peaches are to be counted in measuring.

For perfect knowledge and use of this Table following,  
when parts of Peaches are asforesaid, note well this other  
example that enueth, and also what is said of the declaration  
annexed unto the Table, that the parts of Peaches are in the  
length, breadth, or both.

Imagine f.g.h. to be a round  
peece of land; I finde by mea-  
sure the whole compass 49.  
Peaches. The half is 24.  
and 1/2. I enter with 24.  
and 1/2. in the Table, and  
finde 1/2. and 1/4. which were but parts of Peaches. So have





pee 4. Acres, 2. Rods, 3. Day works, and 3. Bearches For  
those parts of Bearches omitted; at your first entring the  
Table, work thus. The half Bearch, quarter, or other  
part of a Bearch in the length, must be reckoned by them-  
selves in the whole breadth, multiplying the breadth by the  
width in the length. To operate thus, you must multiply the  
width of the length in the whole breadth, and then  
the breadth in the whole length, leaving to be considered got-  
ten, remembering the product of the one fraction multiplied in  
the other, to be pulled from the second. To make this more  
clear plain, I will take this example, let the breadth be  
100 fathoms, and the length 100 fathoms, and the width  
of the Bearch 10 fathoms, and the width of the Bearch  
the odde parts) 4. Acres, 2. Rods, 3. Day works, and 3.  
Bearches. Now for the amount of the parts of Bearches  
left out, I must (as I said) reckon them of the length of the  
breadth, and contrariwise them of the breadth of the length.  
Hark ye, 1. to 7. Bearches, and 1. in a Bearch, and 1. in  
Bearches, which added make 12 Bearches, which added  
to the number afore gotten, which is 4 Acres, 2. Rods, 3. Day  
works, and 3. Bearches, and 1. of a Bearch, the product of the one frac-  
tion multiplied in the other, which is 1. Bearch, which added  
to the number afore gotten, which is 4 Acres, 2. Rods, 3. Day  
works, and 4. Bearches, which is the content of the whole  
counsell the declaration of your Table there as you may see.

Of the half Circle.

**F**or this half Circle, measure the  
table with half the compass, and with half the Diameter of  
the Circle, or with the length  
of the picked hanging Line, k. l.  
For the content of this half Circle  
is 2. Acres, 1. Rod 7. Day  
works, 1. Bearch, and 1. of a Bearch.

To measure  
half circled  
Land.



Another

Another example of Portions

and parts of a Circle,

Suppose a m. a. following, were part of a Circle or pece  
of Land, whose content is defined. The whole compass of  
the Circle, which this portion represents is (as aforesaid)  
99. Pearches: his Diameter is breadth 37. The peaches  
are compass a m. a. is 74. Now with the half breadth or  
semi-diameter of the Circle, 18.5, and with 37, the half of  
the peaches Compass, enter your table for sines, 3. Acres,  
3. Acres, 7. Decimals, 7. Pearches, and 1. of a Pearch,  
the content of the pece of Land full of peaches, to the sides of  
the triangle peaches.

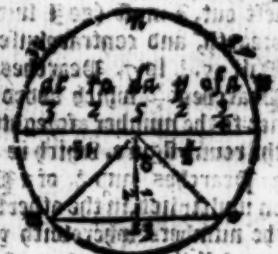
If ye desire to know the summe  
of peaches in the other Por-  
tion beneath the Triangle, se-  
parate by the same m. a. or rule  
and the content of the Triangle  
which is their summe and 1. of a  
Pearch, found by the rule of Tri-  
angles, to the Acres and Pearch-  
es before described. The sume is  
4. Acres, 3. Acres, 7. Decimals,  
this Pearches, and 1. of a  
Pearch.

This subtracted or pulled from the number contained in the  
whole Circle, the remain is the Pearches included in the  
small pece beneath the Triangle. That is, 1. Acre, 36.  
Pearches, and 1. of a Pearch.

How mixed figures are measured.

I think none now will doubt how these two figures fol-  
lowing are measured, because they are made of portions or  
parts of Circles, whose measure is before sufficiently open-  
ned

To measure  
parts of circled  
Land,

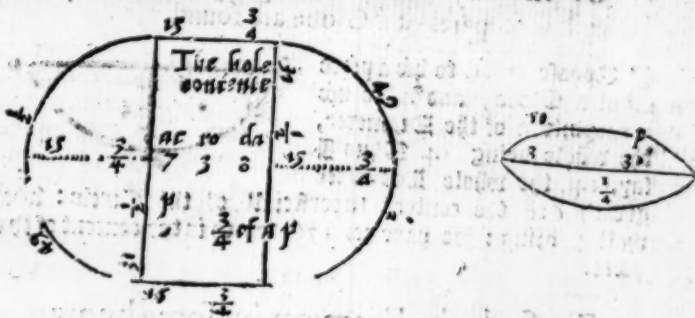


Land com-  
pounded of cir-  
cles or his  
parts,

# measuring of Land.

7

And, the one consisting of two half circles, and a quadrangle :  
the other being the portions of the circle m. o. doubled.



If any evil-fashioned Land chance to be measured, which  
requireth to be brought into many Triangles, to save labour,  
ye may add some portion unto that, and make it square, or  
otherwise. So let them be measured : and after, from the  
product pull away that yet added : The remain is the con-  
tent.

To finde the content superficiall of Steeples,  
Columnes, Globes, and their parts.

**T**o the Arithmetician, I say : for pycked Steeples mul-  
tiply the whole side in half the circumference of the Base,  
adding the plain of that Base. For Pillers ; augment the  
circumference of the Base in the height, putting to the plain  
of both Bases. For Globes, the Diameter in the circumfe-  
rence multiplied. Then so of fragments or parts. Let them  
that be void of Arithmetick enter my table of account fol-  
lowing, with such numbers as I now willed the Arithmetici-  
ans multiply, not forgetting what I have before written. So  
I serve their turn.

To measure  
Steeples,  
Columnes,  
Globes, &c.

C

Or

# The Art of measuring.

Or thus by the rule of proportion, the parts of a Globe are found.

To measure parts of Globes

Suppose a. b. c. to be a piece of a Globe, and 4. to be a proportion of the Diameter, the whole being 14. Thus I say, 14. the whole Diameter giveth 616. the content superficiall of the Circle: what shall 4. bring: So have ye 176. which is the content of that piece.



To finde the Diameter by some known

proportion thereof.

To finde the unknown Diameter of a Globe.

If ye be ignorant what length the Diameter of the Globe is, whose proportion ye have, the height, part of the Diameter, being 4. first, augment half the line, to which is 10. in himself, and the product divide by 4. So have ye 10. to be added to 4. which maketh 14. the whole Diameter.

The true measuring of Mountains and Valesyes.

To measure Mountains.



Thereto Chapter. All ye shall measure the circuit of the foot, or base of the Mountain: then the compass of the summit or top, adding them together. So shall ye doe of the ascents, that is, the going up from the base to the top, joining the measure of the longer and shorter in one. Now take the half of the circuit added, and the half part of the ascents joined, and enter your table: there shall ye see the content.

Example

# Mountains and Valleyes.

9

## Ensample.

A. b. c. is the mountain: a. e. the circuit of the base, being 100. pearches, b. the top 16. pearches. which joyned together, make 116. b. c. the one ascense is 55. pearches: the other 75. These added make 130. The half of the circuite is 50. the half of the ascense 65. With these two numbers ye shall enter your table of account, where ye shall finde 12. Acres, 20. Moods, and 10. pearches, the true content of this barren hill.



Figure of a Mountain.

## Of the Valleyes.

**A**s in the Mountain ye measured the circuit as compasse of the base as first: so here contrary ye shall measure round about the circuit as compasse of the height of the valley. And as ye got the measure as compasse of the top of the Mountain, so measure the circuit of the depth of the Valley. In like manner as ye measured the ascense, that is, the going up from the foot to the top: so measure the descense, going down of the Hill to the depth of the Valley. The rest all work, as I have shewed you in measuring the Mountain.

To measure Valleyes.

For more plainness, behold this

210

ensample in figure. If ye lay together the circuite of the height, and depth, which is 210. and 30. taking the half part of those two circuite, making an 120. then the

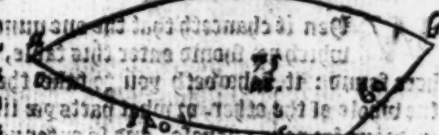


Figure of a Valley.



# The Art of measuring

the two ascenses 140. and 60. added in one product 200. the half thereof being 100. with this and 120. the other half of the Circuit, ye may enter your table. What doing, loe 75. Acres.

How the Table of account now following is to be used,

What is to be done when numbers, which you should enter, exceed your Table.

**W**hen you have gotten a content of length and breadth, (as I have above declared of several triangles and other figures) then you shall enter this table. Look there the length, and most number of Pearches in the higher margine. which signifieth at 10 and under eight yards at 48. Look the other sum of Pearches (I mean the breadth) in the right side and hanging margine; from 1. descending to 30. Now at the meeting of the line, where the one answereth the other directly in a square, you shall finde the Acres, Roods, Day-works, and Pearches. Note that the first number set on the left side, and upper part in any square, signifieth the number of Acres. The figure in the upper part, and right side, both betwixen a Rood, the figure in the lower part, betwixen a Rood: And the figure in the left side beneath, signifieth a Day-work, or Day-works. A figure in the lower part rightward, both betwixen Pearches.

## A Declaration adjoyned.

**W**hen it chanceth that the one number of both, with the which ye should enter this table, are greater then any here saynd: it behoveth you to take the half of the one, and the whole of the other, or what parts ye like of both, most commodious for your purpose; and so enter your table. Look then what is there found, and it shall bear his name of the parts multiplied in themselves.

For example.

# Mountains and Valleyes.

9

## Ensample.

**S**uppose the number with the which ye should enter your table to be 130 Pearches in length, and the breadth 60. neither of these may be found in the margine: wherefore I take the thirde part of an 130. which is 43. Pearches, and one remaineth.

The half 60. that is 30. I finde with entring them at the common meeting 6. Acres, 1. Rod, and 5. Day-wozkes. This summe must have his name of the parts augmented in themselves I took the thirde part of the one, and half the other number, therefore 2. must be multiplied in 3. or contrarie; so have ye six, which signifieth that ye have found by entring but the sixth part of the number ye should finde. Wherefore I must take this summe afoze found (being 6. Acres, 1. Rod, and 5. Day-wozkes) six times as much. So have ye 33. Acres, and one Rod. For the Pearch remaining in length, reckon him in the breadth (as is afoze declared) in the fifth Chapter of the remains: so have ye 60. Pearches moze to be added. So the increase of these two numbers 103. and 60. amount to 38. Acres, two Rods, and five Day-wozkes. Thus any manner length and breadth is reduced to this table following, which sufficeth.

Thus with few woꝝds is ended the certain measuring of all manner of Land, touching the superficial content. Wherefore now shall follow the true measuring of Timber, Stone, Steeples, Pillers, Globes, according to their Crafte.

Such as are altogether ignorant of Arithmetick, may reckon by our English coyn, allowing sozevery Pearch in length or breadth a Penny, and so every Mark makes an Acre, every Noble half an Acre, every forty Pence or half Noble a Rod, and every Penny a square Pearch. And so by memoꝝy without tables, may in some rude and grosse manner, cast up reasonable just the true contents of all Closets, Medowes, Parkes, Hills, or Valleyes.

Look what I have shewed in the Chapter of parts, that understand here of whole Pearches, lest subtracting &c.



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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
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4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
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6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
7	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
8	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160
9	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180
10	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
11	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220
12	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
13	13	26	39	52	65	78	91	104	117	130	143	156	169	182	195	208	221	234	247	260
14	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210	224	238	252	266	280
15	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300
16	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320
17	17	34	51	68	85	102	119	136	153	170	187	204	221	238	255	272	289	306	323	340
18	18	36	54	72	90	108	126	144	162	180	198	216	234	252	270	288	306	324	342	360
19	19	38	57	76	95	114	133	152	171	190	209	228	247	266	285	304	323	342	361	380
20	40	80	120	160	200	240	280	320	360	400	440	480	520	560	600	640	680	720	760	800

# T A B V L A C

The table is a triangular grid of numbers. The top row is numbered 1 to 22. The leftmost column is also numbered 1 to 22. The numbers within the grid are small, handwritten-style digits. A large, curved, shaded area on the left side of the page partially obscures the table, starting from the bottom left and curving upwards and to the right.

The numbers in the table are as follows (row by row):

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
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4	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88
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8	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	168	176
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11	11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220	231	242
12	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264
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15	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330
16	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320	336	352
17	17	34	51	68	85	102	119	136	153	170	187	204	221	238	255	272	289	306	323	340	357	374
18	18	36	54	72	90	108	126	144	162	180	198	216	234	252	270	288	306	324	342	360	378	396
19	19	38	57	76	95	114	133	152	171	190	209	228	247	266	285	304	323	342	361	380	399	418
20	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440
21	21	42	63	84	105	126	147	168	189	210	231	252	273	294	315	336	357	378	399	420	441	462
22	22	44	66	88	110	132	154	176	198	220	242	264	286	308	330	352	374	396	418	440	462	484

The Table  
of a rompre.

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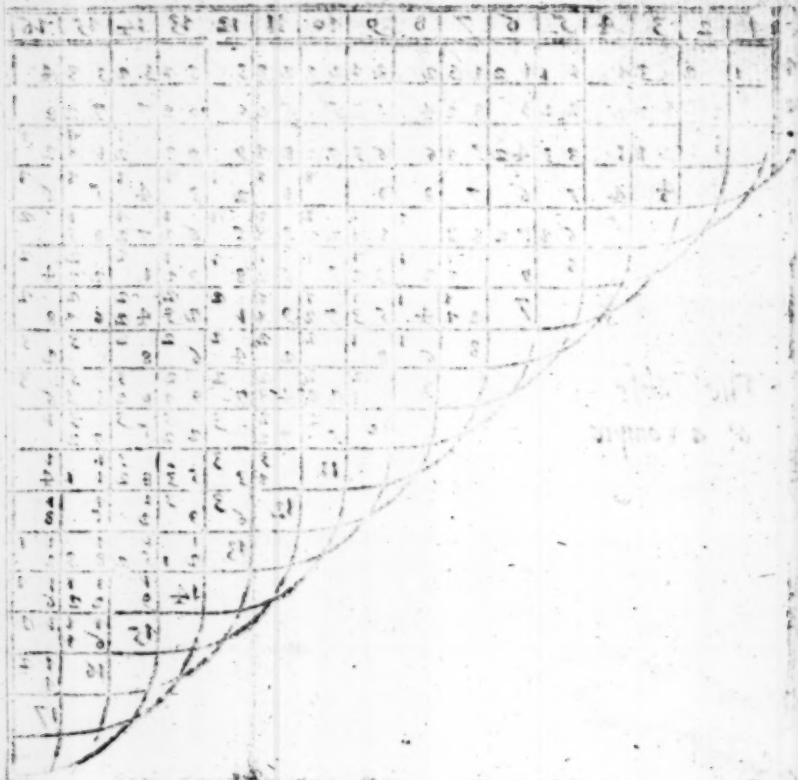


# COMPUTATIONIS

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40	1	1	1	1	2	2	2	2	3	3	4	4	4	4	5	5	6	6	7	7	8	8	9	2	

TABLE



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## *To the Reader.*



**I** commeth commonly to pass, that Carpenters, Masons, and such like Artificers, are put either to measure Timber every way square, or squared Logs, broader on the one side than on the other; yea many times mutilate or unperfect stuff. Sometimes three, five, ten, or twenty square in the head, and so through: oftentimes round Stone or Timber with-hollowed, &c. Afore I shew unto them what must be done with such peeces of Timber or Stone, to get their true measure, my desire shall be that such Craftsmen will leave to be heady or selfe willed; yea so greedily to stick to their corrupted rules, that utterly they refuse to bee taught.

Both learning and experience declareth unto me, that the grounds which the best of them have, are false. To open how and where, it needeth not; neither doth it appertain to instruction, only it may suffice him that liketh the true way, here to receive it appointed to him. Yet to satisfie and content him which will not beleeve any such errors or false grounds to be, I say (and truly) that the Ruler of Timber measure, which the most part of them hath, is not made by the right Art: besides that their Craft in seeking the Square of Timber is very false. They use in measuring, to lay the broader and the narrower sides together in a sum, and to take the half of that number for the square. Then they seek this untrue square upon the false Ruler, and so measuring the Timber, they conclude

## To the Reader.

In a foot  
square is con-  
tained 171.  
inches.

conclude of it untruly. As this is corrupted, so are other grounds which they take to be infallible. Now to the purpose, touching the correction of those errors, with other not mentioned, whereby true measuring may ensue, this way shall be taken. After I have opened how you must handle all such fashioned Timber (as afore is spoken of) there shall follow a Table in which ye may finde (as I will declare) the square of any Stone or Timber. That known, it is requisite to have another Table immediately following, which may appoint to all true squares from 1. to 6. inches, the just length to make a foot every way square. With the length agreeable to your Square, your Log must be measured. And as oft as ye finde it from the one end to the other of your Timber, so oft you may conclude the foot square to be contained in that Timber, Logge, or Stone: that is, so many square Feet there to be included. This Table of Timber-measure standeth in the place of a good Ruler, well decked with true measures. By this ye may make or correct Rulers at pleasure, as after appeareth.

*Now orderly followeth the true measuring of all fashioned  
Timber or Stone asorenamed.*



How Timber or Stone four Square every  
way, or broader on the one side than on  
the other, is measured.

*The vii. Chapter.*



If a piece of Timber or Stone, be either  
equally square, broader on the one side  
than on the other, ye shall take the just  
measure, I mean, how many inches  
the broader side containeth: even so of  
the narrower. This done, ye must seek  
in the table of Squares following, the  
measure of the broader side of the Tim-  
ber or Stone, in the upper margine of that table. Then look  
for the number of inches, of the equall or narrower side, in the  
right part and hanging margine. At the common meeting  
where the one number answereth directly to the other, there  
your true square shall appear. This square so found, shall  
be referred to your table of timber measure: in the which you  
may plainly see (if you runne down by the left margine, untill  
your inches square appear) how many set or inches of your  
Ruler belong to a set square. As often as that measure there  
found, is contained in the Timber or Stone, so often and as  
many set square ye may conclude (without doubt) the piece of  
Timber or Stone to have.

**D**

Ensample.



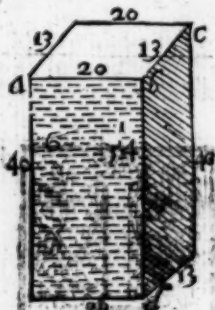
# The Art of measuring

## Ensample.

Suppose this square Timber or Stone a. b. c. d. were to be measured, the broader side a. b. 20. inches, the narrower side b. c. 13. inches, the length 40. inches. Now I must seek the broader side 20. in the upper margine of the table. The narrower side 13. must be found in the right side and hanging margine. At their common meeting 16. inches, and  $\frac{1}{2}$  part of an inch shall appear.

This true square must be searched for in the table of timber measure. There, you look for 16. in the margine of this table. In the squares with him rightward, you shall finde 6. inches, and  $\frac{1}{4}$  which is three quarters of an inch. Some deal less of your ruler than 6. and  $\frac{1}{4}$  laid out upon the Timber maketh a foot square. And that measure so breely handled, is contained in the length of your timber six times.

We heretofore affirme the foot there to be, besides that is left  $\frac{1}{4}$  part of a foot. Note because the squares at all times in this Ensample rise not to even inches, but sometime to odd parts: therefore according to your discretion, add or take away some part more or less in setting forth the foot square, as aboue is performed.



It were insatiable tediousness, yea impossible to set forth the true quantities of timber measure, to all odd quantities of squares. The discreet handling of these, the witty shall bring to a sufficient exactness.

Of Timber or Stone, 3. 5. 10. 20. or

more sides square, &c.



When Timber hath diuers equall squares in the head, and so through first measure all the square sides round about the head or end of the Timber: Then take half the number of the whole measure for one breadth.

Then measure from the Center (which is the middle of the head, or end of the Timber) to the middle of the square side, between the two Angles, and take the measure of that distance for the other breadth. Then resort with the measures of these two breadths, (as before) to the table of squares: seeing the bigger number as breadth in the upper margine, and the other lesser in the side margine: with the square there found, haue recourse to the table of timber measure, and doe as I haue instructed.

Example.

Admit this small piece of Timber side square, e. f. g. h. should be measured, every side being 12. inches. If ye add together in one summe all the side sides, they make 60. inches. The half is 30. that serueth for one breadth. Then the line e. f. which goeth from the Center or middle of the square, to the middle of one side, is 8. inches. The two numbers 30 and 8 must be sought (as before) in the table of squares following. At the common meeting, your square shall appear 15. inches, &  $\frac{1}{2}$ . This square 15. seek in the table of timber measure where ye may see right with at 7. inches, and  $\frac{1}{2}$ . Now because of  $\frac{1}{2}$ . the odd quantity of the



# The Art of measuring

square above 15. inches, lay something lesse. Then let how oftentimes that measure (so with discretion handled) is from the one end of your Timber to the other; and affirme so many times a foot square there to be, as that measure is found in the length of your Logge.

How round and hollow Timber, Steeples, Pillers, Globes, &c. are to be measured.

*The ix. Chapter.*



First gird the Log round about with some Line: then divide the Line which compasseth that Timber in two equall parts: keep the one part for the bigger breadth. After, ye shall divide again that whole length, (the two and twentieth part cast away) in three parts, and take the half of one of them for the other narrower breadth. With the measures of these two breadths, haile to your table, performing all things as afoze is opened.

Ensample.

Suppose this little piece of Timber, i. k. l. m. were to be measured, the compass of girding 36. inches, and the half of that is 18. being the one breadth: then the third of 36. is 12. the half of it is 6. which is the other narrower breadth, with these two numbers 6. and 18. enter the table of Squares following, and so the table of timber measure. At the last (all things performed as befoze) ye shall finde in this round Log, the length l. m. being 18. inches, 1. foot, and  $\frac{1}{3}$  part of a foot: This is sufficient for all such like.



A.

A note of hollowed Timber.

**I**f it chance that hollowed Timber be to be measured: measure the whole Logge as though it were not hollow, as a booke is declared. Then measure the narrower and broader side of the hollow, and see what is contained in that, as though it were massie Timber. Then pull out the content of it, from the whole above measured: the remain of force will shew what Timber is included in that hollowed body.

**I**Am unable in few words to expresse to the unlearned, by what mean Pyramidall, or picked regular Steeples of all fashions are measured. Also how Pillars, how the content of Globes or Bowles are searched, unless the art of numbering were taught. That being known: thus (as now followeth) I teach.

How the crassitude of picked Steeples is known.

**M**ultiply the plain of the Base in the third part of the height; so ye have the crassitude. Or multiply the content superficiall (found as I have instructed) in the height of the Steeple, taking for your purpose the third part of that product.

How the content of Pillars

is known.

**E**crease the Base plain in his altitude or height; so have ye your desire.

# The Art of measuring

## How the Cubicall bodies of Globes are searched.

**T**he content superfiціаль found, (as I have opened must be multiplied in the fifth part of the Diameter: the product is that we require: or the third part of the superfiціаль content is half the Diameter. Or multiply the plain of the Circle in the whole Diameter: then take two third parts, which added, make the Crassitude.

## Of the half Circle.

**H**is superfiціаль content multiplied (as I said) bringeth the magnitude of him. If any man require ensamples of these last matters, or moze sufficient handling; let them resort unto my books published of Geometry, where they shall be satisfied. These little appertain to Carpenters or Masons: therefore not by ensample declared.

## A generall note.

**N**ow when thou shalt be put to measure some body, with out order or fashion, lacking part of his square, or having more than his forme: if it lack, thou shalt make it perfect, by observing diligently the running together of the sides. The parts wanting shall be measured, as though they were there, which portions must be taken from the whole body measured.

And when there resulteth any more than the forme or regular square: first measure the square Body; then the Crassitude which accommeth. All put together doeth the whole irregular Body. This sufficeth.



## A Table to finde the iust radix or square of any Timber or Stone.



**I** behoweth you to know, that this table following is made for the true square of any manner of Timber: therefore understand that the numbers from 1. to 40. set above in the high margin, betoken the inches of the broader side of the Timber. And the numbers from 1. and so downward to 30. put in the right part and hanging margine of this table, signifie the inches of the narrower side: and to conclude briefly, the element of figures set in every square room, betoken the iust square. The bigger figures leftward in every square place, signifie the whole inches. And the other lesser rightward in the same square divided by a line, the parts of inches,  $\frac{1}{2}$  &c.

This first fraction toward the left hand, betokeneth one half part of an inch: the other two fifts of an inch, and every figure of fraction having a point adjoyned unto him, some deal less than that part is: as that part  $\frac{1}{5}$  representeth scant half an inch, a very little quantity less. And if it had two picks by him, he should have declared some quantity more: as this other fraction of part,  $\frac{2}{5}$ : which is more than two fifts a small deal.

It had not been needfull to have put the parts of the Square so precisely as they are here: neither is it requisite so curiously to take them.

Other factors of great importance are the following: (1) the quality of the material used in the construction of the machine; (2) the skill of the operator; (3) the condition of the machine; (4) the method of operation; (5) the time of day; (6) the season of the year; (7) the weather; (8) the state of the mind; (9) the state of the body; (10) the state of the soul.

...and the fact that the ...

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50																																																																																																																					
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7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147	154	161	168	175	182	189	196	203	210	217	224	231	238	245	252	259	266	273	280	287	294	301	308	315	322	329	336	343	350	357	364	371	378	385	392	399	406	413	420	427	434	441	448	455	462	469	476	483	490	497	504	511	518	525	532	539	546	553	560	567	574	581	588	595	602	609	616	623	630	637	644	651	658	665	672	679	686	693	700	707	714	721	728	735	742	749	756	763	770	777	784	791	798	805	812	819	826	833	840	847	854	861	868	875	882	889	896	903	910	917	924	931	938	945	952	959	966	973	980	987	994	1000																								
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11	22	33	44	55	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220	231	242	253	264	275	286	297	308	319	330	341	352	363	374	385	396	407	418	429	440	451	462	473	484	495	506	517	528	539	550	561	572	583	594	605	616	627	638	649	660	671	682	693	704	715	726	737	748	759	770	781	792	803	814	825	836	847	858	869	880	891	902	913	924	935	946	957	968	979	990	999	1000																																																																											
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16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320	336	352	368	384	400	416	432	448	464	480	496	512	528	544	560	576	592	608	624	640	656	672	688	704	720	736	752	768	784	800	816	832	848	864	880	896	912	928	944	960	976	992	999	1000																																																																																																							
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18	36	54	72	90	108	126	144	162	180	198	216	234	252	270	288	306	324	342	360	378	396	414	432	450	468	486	504	522	540	558	576	594	61																																																																																																																																					

# ∞ TABVLA

The table is a triangular grid of squares, each containing a value. The values are arranged in a way that suggests a multiplication table, with the top row and left column representing the factors and the interior cells representing the products. The values are written in a mix of integers, fractions, and decimals, indicating a historical or scientific context.

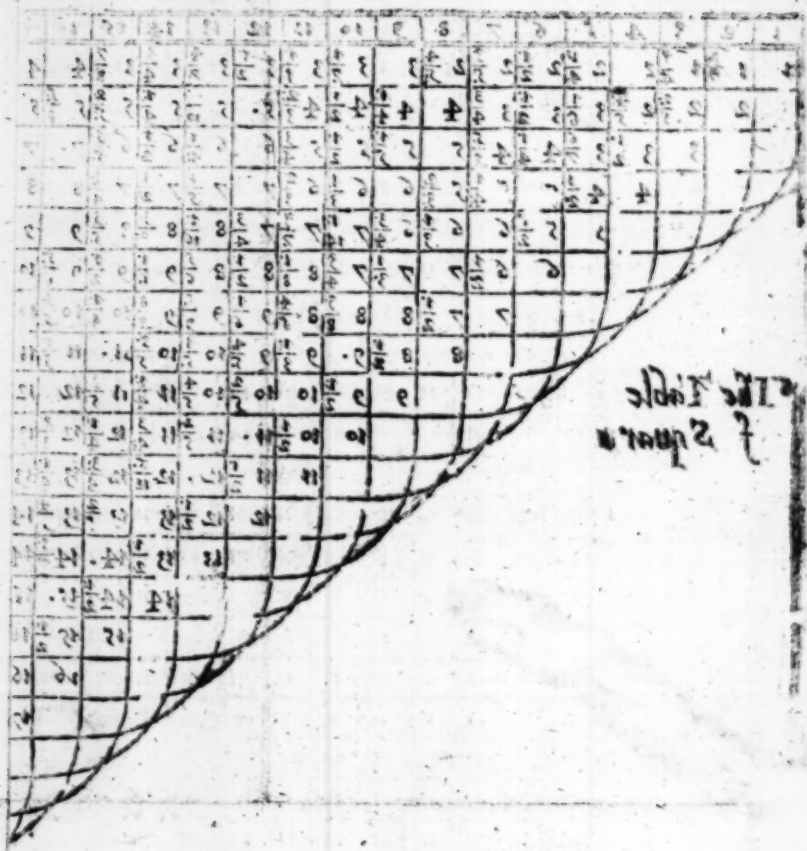
The Table  
f Squares

Place this Table between D and E





STAV B



Place this Table over the D and E

# The Table of Timber measure, with the declaration and use of it.

16

The x. Chapter.

**T**his Table (as ye see) is diuided into  
two Columnes of Rows: the one be-  
re short, the other longer. In the head of the  
first, I haue put this word Foot: in the se-  
cond row Inches, and parts to signifie yet,  
Inches and parts of Inches. The summes  
in the margins and left part of the first and  
second Columnes, declare the quantity of the  
square of Timber of Stone from 1. to 36.  
Inches square. Within the rowes you may  
finde the just length to a foot square, if ye  
enter into them in right order according to  
the square.

Example.

**S**uppose the square of your Timber  
were 70 inches and that ye desire to  
know what measure of length of the ruler  
would make a foot square: look in the left  
margin, seuen inches: and with him in  
that order toward the right hand, ye shall  
finde 1. foot, 11. inches and  $\frac{2}{3}$  of an inch.

Note because the fraction  $\frac{2}{3}$  hath a prick by  
him, it betokeneth some small quantity less  
then  $\frac{2}{3}$  of an inch. If it had two pricks or  
points thus  $\frac{2}{3}$  it should signifie some little  
quantity more. Neither maketh it matter  
whether ye obserue this pricking or no, the  
quantity is so little to be added or pulled  
away.

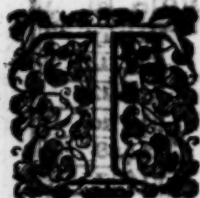
Note what hath been spoken of Timber,  
the same also is to be understood of Stone,  
likewise to be measured.

Thus is finished their measurnig of Timber.

Now ensueth of Board.

Foot		Inches	Parts
1	2		
1	44		
2	36		
3	26		
4	19		
5	15	9	
6	12		
7	10	11	
8	8	3	
9	7	21	
10	6		
11	5	14	
12	4		
13	3	10	
14	2	8	
15	1	7	
16		6	
17		6	
18		5	
19		4	
20		4	
21		3	
22		3	
23		3	
24		3	
25		2	
26		2	
27		2	
28		2	
29		2	
30		1	
31		1	
32		1	
33		1	
34		1	
35		1	
36		1	

How Tables, Boords, Glass, or any such like,  
are measured, according to their length and  
breadth, only to the foot square.



This thing is performed by the help of a  
large Table following, divided in five  
small Tables, and as many Margines.  
The first and last Margines beginneth at  
which is one quarter of an inch, and  
extended to six inches, as ye may plainly  
perceibe if ye run down by that Margine.  
This hath his Table on the right side ad-  
joining unto him. The other taketh his beginning at six in-  
ches, and endeth at twelve, having his proper Table also.  
The third from 12 to 18, and the fourth from 18 to 24, and the  
fifth from 24 to 30. The last Margine is from 30 to 36, and there  
endeth.

Of this that is said, you may gather that every Margin hath  
his Table on his right side. Also you must know that in the  
top, and length, I have put (as in the Table of Window  
measure) these words, feet, inches, and parts, to signifie feet,  
inches, and parts of an inch. And therefore ye list to measure  
Boards, Glasse, or any other such, with the breadth of it enter  
this Table, and seek that breadth in his proper Margin; there  
ye shall finde in right order how many feet, inches, and parts  
of an inch, belong to a foot square. So often as the mea-  
sure is in your staffe, list as many feet have ye in that Board,  
or inch this. If the breadth exceed this Table, then divide the  
breadth in parts, and work as is, and shall be declared. So  
the ingenious applyeth this Table for all manner breadths,  
and exactly.



Example.

Fo Yu		Fo Yu		Yu Par		Yu Par		Yu Par		Yu Par											
1/4	48	6	1/4	11	1/2	12	1/4	11	3/4	18	1/4	7	7/8	24	1/4	5	5/16	30	1/4	4	3/4
1/2	24	6	1/2	10	1/2	12	1/2	11	1/2	18	1/2	7	4/8	24	1/2	5	7/8	30	1/2	4	5/8
3/4	16	6	3/4	9	1/2	12	3/4	11	3/4	18	3/4	7	2/4	24	3/4	5	3/4	30	3/4	4	2/4
1	12	7	1	8	1/2	13	1	11	1	19	1	7	1/4	25	1	5	1/2	31	1	4	5/8
1 1/4	9	7	1 1/4	7	1/2	13	1 1/4	10	1/2	19	1 1/4	7	1/8	25	1 1/4	5	3/4	31	1 1/4	4	5/8
1 1/2	8	7	1 1/2	7	1/2	13	1 1/2	10	1/2	13	1 1/2	7	3/8	35	1 1/2	5	3/4	31	1 1/2	4	4/8
1 3/4	6	7	1 3/4	6	1/2	13	1 3/4	10	3/4	12	1 3/4	7	2/8	25	1 3/4	5	3/4	31	1 3/4	4	1/2
2	6	8	2	6	1/2	14	2	10	1	20	2	7	1/8	26	2	5	1/2	32	2	4	1/2
2 1/4	4	8	2 1/4	5	1/2	14	2 1/4	10	1/4	20	2 1/4	7	1/8	26	2 1/4	5	1/2	32	2 1/4	4	1/2
2 1/2	4	9	2 1/2	5	1/2	14	2 1/2	10	1/2	20	2 1/2	7	1/8	26	2 1/2	5	1/2	32	2 1/2	4	3/8
2 3/4	4	9	2 3/4	5	1/2	14	2 3/4	10	3/4	20	2 3/4	7	1/8	26	2 3/4	5	1/2	32	2 3/4	4	3/8
3	4	9	3	5	1/2	15	3	11	1/2	21	3	6	1/8	27	3	5	1/2	33	3	4	1/2
3 1/4	3	8	3 1/4	4	1/2	15	3 1/4	11	1/4	21	3 1/4	6	1/8	27	3 1/4	5	1/2	33	3 1/4	4	1/2
3 1/2	3	8	3 1/2	4	1/2	15	3 1/2	11	1/2	21	3 1/2	6	1/8	27	3 1/2	5	1/2	33	3 1/2	4	1/2
3 3/4	3	8	3 3/4	4	1/2	15	3 3/4	11	3/4	21	3 3/4	6	1/8	27	3 3/4	5	1/2	33	3 3/4	4	1/2
4	3	8	4	4	1/2	16	4	12	1/2	22	4	6	1/8	28	4	5	1/2	34	4	4	1/2
4 1/4	2	9	4 1/4	4	1/2	16	4 1/4	12	1/4	22	4 1/4	6	1/8	28	4 1/4	5	1/2	34	4 1/4	4	1/2
4 1/2	2	9	4 1/2	4	1/2	16	4 1/2	12	1/2	22	4 1/2	6	1/8	28	4 1/2	5	1/2	34	4 1/2	4	1/2
4 3/4	2	9	4 3/4	4	1/2	16	4 3/4	12	3/4	22	4 3/4	6	1/8	28	4 3/4	5	1/2	34	4 3/4	4	1/2
5	2	9	5	4	1/2	17	5	13	1/2	23	5	6	1/8	29	5	5	1/2	35	5	4	1/2
5 1/4	2	9	5 1/4	4	1/2	17	5 1/4	13	1/4	23	5 1/4	6	1/8	29	5 1/4	5	1/2	35	5 1/4	4	1/2
5 1/2	2	9	5 1/2	4	1/2	17	5 1/2	13	1/2	23	5 1/2	6	1/8	29	5 1/2	5	1/2	35	5 1/2	4	1/2
5 3/4	2	9	5 3/4	4	1/2	17	5 3/4	13	3/4	23	5 3/4	6	1/8	29	5 3/4	5	1/2	35	5 3/4	4	1/2
6	2	9	6	4	1/2	18	6	14	1/2	24	6	6	1/8	30	6	5	1/2	36	6	4	1/2
Fo Yu		Fo Yu		Yu Par		Yu Par		Yu Par		Yu Par											

# The Art of measuring

## Ensamble.

**S**uppose I have a Pane of Glasse, or a Board, whose breadth were 22. inches,  $\frac{1}{2}$  the length 16. foot. In the fourth margin, I finde this breadth, 22.  $\frac{1}{2}$ . And eben with it in the table rightward, I see 6. inches,  $\frac{1}{2}$ . So much of my Ruler wanting some small quantity, maketh a foot.

Now because in the length of my board (which is 16. foot) that measure is found 29. times, and  $\frac{1}{2}$  parts, I conclude 29. foot there to be, and two thirde parts of a foot Square, according to the length and breadth I said (wanting some small quantity) because of the point joyned to this fraction  $\frac{1}{2}$ . which is put to diminish the fraction some little thing, as is declared plainly in the other Tables before put forth.

**H**e that desireth to measure Chamber floozes Pavements, or such like, let him only multiply the breadth with the length, so the product sheweth the content.

## Example.

**I**f there were a Pavement 100. foot long, and in breadth 50. I must needs conclude by multiplication of the length in the breadth there to be contained 5000. foot.

Or thus without Arithmetick; when the breadth exceedeth the Table.

**D**Ivide the breadth in parts (as is opened in the Declaration of the Table of account) and work as I have before instructed. So for Pavements all manner of wayes it serveth your turn. Of this matter to put forth Tables were superfluous tediousnes and folly. The ingenious with these few will be satisfied.

The



# The Carpenters Ruler.

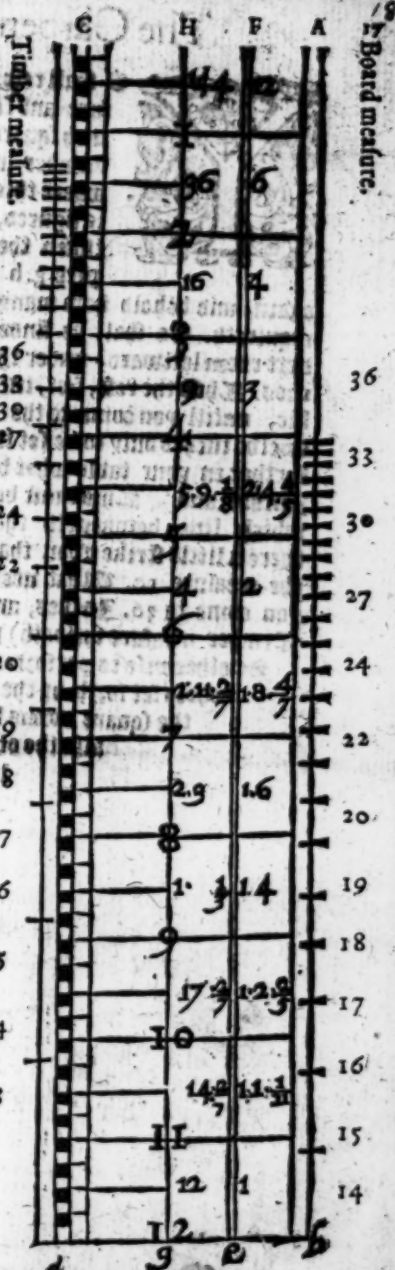
The face of the Carpenters Ruler, figured with the true measure and other things necessary.

## The xii. Chapter.

**B**ECAUSE the effect of this Ruler is above declared by tables; an Instrument also well known & common among good Artificers, I will not spend many words in praising it. Behold the Figures and learn by them how ye ought to make and commonly to deck your Ruler both with timber & board measure.

## Example

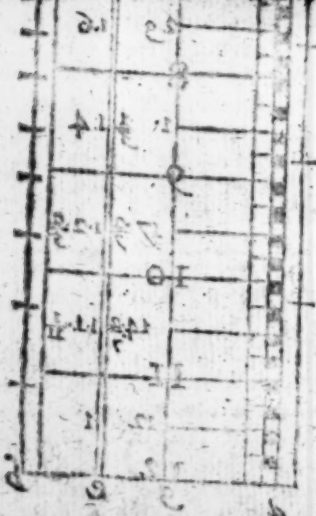
Suppose the Ruler to be as a. b. c. d. well plained 12. inches long, a quarter of an inch thick, and two inches in breadth. Truly it were more commodious, if it had two foot in length. This Ruler here imagined, but a foot in length is divided first in 12. even parts called inches: then every inch in half or two equall portions; each half in two quarters; every quarter in four or two parts at the least; 15 as in this ensample. Then are the figures placed from 1. to 12. manifesting the inches. Thus your Ruler is ready to receive the measures which are marked or figured on your Ruler thus. Add first the timber measure, as followeth.



# The Carpenters Ruler.



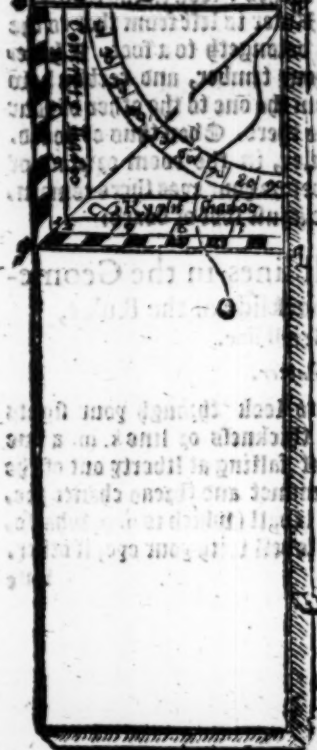
shall resort to your Table of timber mea-  
sure and see how many feet belong to one  
inch square: there ye shall finde 144. This  
number note, write, or rather grave,  
where this figure 1. representing one inch,  
is figured, as ye may see in the widest be-  
tween the line e. f. and the line of the  
rule g. h. This done, resort to your table  
again, and behold how many feet and parts two inches square  
requireth. Ye shall ye finde 36. feet, which is placed in the  
next room leftward, under the Character 2. signifying two in-  
ches. Thus the rest, feet, inches, and parts, being in your ta-  
ble, untill you come to the 12. inch, where ye shall perceive  
twelve inches only to be set in his proper room, &c. Then look  
further in your table what belongeth to 12. Inches. As for  
feet, and. This must be numbered in the line c. d. from c.  
which line betakeneth the thickness of the Ruler. Make  
here a little strike upon that grossness, even as right against  
the measure 10. What need many words: Thus doe untill  
you come to 36. Inches, and that is noted (as the Table of  
Timber measure sheweth) right with one Inch, and 1. foot c.  
So otherwise is performed of Board measure, as ye may  
behold set forth by the help of this proper Table in  
the square, which becometh the line e. f. and  
all the other thicknesses



line b. a. and  
the  
The

# The backside of the ruler.

## Lyne of Scale



**T**his other figure i. k. l. m. is the backside of your ruler, having in the midst of Geometrical Quadrant.

whose making is thus expressed. The line o. p. both of your ruler n. o. the line o. p. q. r. s. ought to be of one equal length, cutting each other squarewise.

And from the center n. unto p. is drawn another line, which is called the line of height. So is o. n. the line of level, q. n. the line of heights upright: this known, I open the compass, one foot remaining. In the center n. the other extended in the line of level almost to o. making a circumference to q. n. which is a portion of a circle named a quadrant and ought to be divided into 90 equal parts, as ye may behold, every of them called a degree.

We may divide the lines o. p. p. q. named the Scale, each in 12. as here, or in 60. yea in a 100. equal portions as may meet for the use of shadows, heights, lengths, &c. Note that the side o. p. half scale o. p. is called the contrary shadow p. q. right shadow. Remember that upon the thickness m. k. ye ought to have two fine equal square sights well bozod, represented here by r. s. made of wood, or rather metall to be fastened there when time requireth: let this suffice.

The making of a Geometric quadrant.

Note these 3 principal line

The divided sides o. p. and p. q. are called the Scale.

# The Carpenters Ruler

The common use of the Carpenters Ruler,  
touching the face afore put forth.

## The xliii. Chapter.

be eighth  
apter shew-  
a how he  
square is  
und.



Suppose a peece of Timber be moaten, whose true square is 7. inches, this square appointed you to the figure of 7. in the line g. h. under whom rightward in the place assigned to Timber measure is written 2. foot, 11. inches,  $\frac{2}{3}$ . As often as that measure is found in the length of your Timber, so many foot of Timber is in that peece.

## Another Ensamble,

Imagine your square to be 22. inches: seek in the line a. c. Note then how much of your Ruler is left from that to the end of your Ruler c. and so much belongeth to a foot. There fore lay out the measure upon your timber, and reckon how many times ye may finde it, from the one to the other of your Log; so so many foot of timber is there. Then thus of board. Seek the breadth upon your Ruler, in the room or place of board measure, and immediately before your eyes there remaineth what is to be laid out to make a just foot of board.

The use of the principall lines in the Geometrical Quadrant on the backside of the Ruler,  
and first of the levell line.


## The xlv. Chapter.

Behoodeth you to look through your sights  
placed in the thickness of line k. m. a fine  
thread and plummet falling at liberty out of the  
center o. If this plummet and thread chance pre-  
cisely on the line of levell (which is o. o. whatso-  
ever ye be through the sights, is levell with your eye, if other-  
wise

Isse the thing that ye looke into is not leuell, either more or  
less then the height, or leuell of your eye: 1. If the place  
niet fall to your ward: less, if contrary.

How by the Line of Levell to foresee whether  
the water of any Spring or head is possible to be  
brought to a place appointed, and also to judge  
the wholsomness of it

## The xvi. Chapter.

 Shall goe to the head of Spring, and set your Kn.  
Ike to your eye (being in height equal with the  
water) so that the line cozd and plummet fall pre-  
cisely in the line of leuell. Now if through the  
sights ye may see above the place, know and iudge  
the water possible to be brought: if your sight fall under, im-  
possible. It commeth commonly to passe, when the place to  
which ye would have water conveyed, is of any great distance  
from the head, then Hills, Valleys, and such like impedi-  
ments, let the line visuall to have his free course: wherefore  
this remedy is provided. At the head of the Spring, ye shall  
look throught the sights (as before) and note a mark, in the next  
Hill toward the place, then goe to the mark, in like manner  
observe another in some Hill: In forth untill by any of them  
ye may perceive the place desired. If then your sight running,  
through the pins of your Ruler (the thread eber falling on the  
Line n. o.) exceed that place, the conveying of your water is  
possible: otherwise not.

Now by the way by which ye shall be instructed, how ye may  
know the wholsomness.

## How good water is known.

**T**ake a clean Pot, and put water in it: so set it on the fire:  
After a little boyling, poyse it out, if then no filth re-  
main



## The use of the Scale.

main in the bottom of the pot, it may be judged the wholesome-  
mer. And thus. Let fall drops upon me fall; or rather on glass  
(any of them being polished) and suffer that to try by it self:  
if after there remain no spot or signe, it is a good token. Poze,  
over, if your water be sweet, pure, clear, light, or of little  
weight, it followeth the water to be wholesome for the use of  
man.

## Of the Line of Height.

**W**hensoever the Thread and Plummets doe chance just-  
ly on the Height, which is in the Altitude or height  
that ye see is even with the distance from the middle of your  
foot; to the nether part directly under the top; equall with your  
standing, adding the height of your eyes above ground. Know that  
ye must ever stand upright with Body and Feet, your feet  
just together, the one Eye closed, &c.

## The Line of upright Altitudes

**L**ay also any thing plumb upright when the thickness of  
your Ruler is. is closely thereon, the Plummets thereat li-  
berty falling on q. n. named the line of height upward. Now  
followeth the rule of the Scale.

**To search out Heights by the Scale**  
with the aid of two places.

### The viii. Chapter.



**At the Thread and Plummets fall in the one, or  
the 12. points: in the other station on the 6.  
of the right shadow: double the distance between  
the two places, the summits appeareth from  
that part of the thing measured, which is equall**

In height with your eye. D; the one in the 12. the other in 8. at right angles: then triple the distance. The one in 12. the other in 6. at right angles: place the Scale. The one in 12. the other in 6. of the contrary shadow, then the space between both the Stations is equal with that ye measure, &er under standing from your eye upward. When that line cometh to pass, it in the one the Thread be found upon the 6. of the contrary, in the other on the 4. of the same, or the 4. and 3. of the contrary. For all these the Spacelness equal with the altitude. And then in measuring the distance between the two places, ye have the height from your eye upward, putting to it the length from your sight downward, the whole altitude appeareth: the Base being equal with your standing.

I would not have you ignorant here how to know lengths which be in the height not easie to come unto. For (as before) got the height of the top, the altitude of the Base or longer part of your length. Doubt not the less height but of the more, of force your desired length remaineth. Or thus: Let the plummet and thread fall in the 12. Mark your place: goe in toward the thing (the thread as it was) untill ye see the Base of that length: the distance between the two Standings, is undoubtedly the length.

How lengths  
in heights are  
known.

**How with Scale direct or upright,  
heights by their shadowes are**

declared.

**This is Chapter**



Turn your left toe unto the Sun. suffering his beams to pierce both your sights. q. r. placed (as afore is said) in the thickness of line k. m. The thread or plummet then hanging at liberty, out of the Centers, betweth as well the degrees of height to be counted from o. as the

parts

# The use of the

the parts of the Scale cut. If your thread be found in the 12. part of line of leuell, shadowes of all things being perpendicular elevated, are equall with their bodies. If the plummet with the thread be perceived, cutting the parts next to the sights, which I name points of the right shadow, then every thing direct is more than his shadow, by that proportion which 12. exceedeth the parts, where the thread was found. If it fall in 1. that is the first part of the right shadow, take the shadow twelve times, to make the height in fow, that is the second part, six times; in the third four times; in the fourth, three times; in the fifth twice; and 12. of the shadow, in the first twice; in the seventh once, and 1. in the eighth once, and 1. in the ninth once, and 1. in the tenth once, and 1. in the eleventh once, you shall take the shadow once, and 1. part of it.

Right shadow

Contrary shadow.

If the art of numbering were had, I would tell you how to multiply the length of the shadow by 12. and the product divide by the parts, in the which was found the thread. But if it be in the parts of the contrary shadow, augment the length of the shadow with the parts declared by the plummet; and in the increase divide them by 12. and so cometh the altitude also.

Thus the composition and whole appliance of the Carpenters Ruler is shewed: therefore somewhat shall be now said of the Squire.

I am not ignorant that the common use of him, is better known than I can with many words expresse, wherefore I leave to write in that behalf. Notwithstanding I will declare how heights and lengths are taken, &c. matters rare and known of few Artificers.

Also by tables to get a true knowledge of the day, hours, and that divers waies, with the help of the Squire, as is appointed in my generall Proposition, augmented in the year of our Lord 1556.

What

# Carpenters Squire.

22

What length the sides of the Squire ought to be, and the division of him.

*The xx. Chapter.*

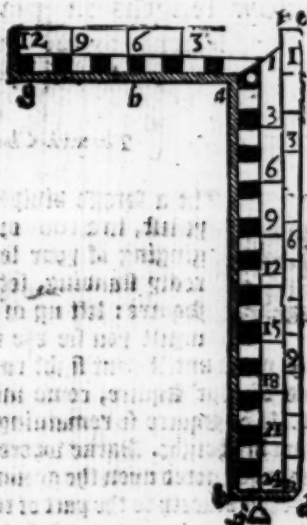
**I** did not to put forth the exact making of this Instrument so well known. So therefore the figure. One side supposed two foot from the inward Angle: and the other a full foot from the same. The longer a. b. is infinitely divided from the Angle a. into b. into equal principal parts, and every of them into a less (if ye list) each containing 10. minutes, and the five c. d. in the outward contrary plain from the top a. into d. is divided into 10. even positions: and again (if ye require degrees) every of them in 6. each of value 10. minutes. Behold a line and plummet falling from e. to f. a parallel to c. d. and a. b. Thus this Squire is well framed for the use of divers Tables put forth in my generall Prognostication, and also for the finding of altitudes and longitudes, which here I purpose now briefly to open.

**How by the Squire heights are known.**

**A**ltitudes or heights are found, the line of plummet centered in the first point, cutting h. the middle of a. g. The

3

mobeable



## The use of the

measurable sights placed in a. g. or a parallell from that line not unlike, as is opened of the line of height, in the back of my Ruler.

### How lengths in plain ground are

searched by the Carpenters or

Masons Squire.

The xxi. Chapter.



Take a Staffe divided into certain portions as ye list, in a 100. or a 1000 parts. At the beginning of your length, upon the very top directly standing, set in the inward Angle of the Squire: lift up or put down this instrument untill you see the furthest part of your longitude, & mean untill your sight running from that Angle, to the end of your Squire, come unto the furthest part of that length. The Squire so remaining, and the Staffe not removed from his height. Marke where the other end of the Squire next unto you noted upon the ground. And what proportion the Staffe then beareth to the part of the ground, which the nearest end of the Squire pointed unto from the Staffe; the same shall the length beare to the quantity of the same Staffe.

### Example

The Staffe a. c. in this figure is imagined 6. foot, and the space a. d. 2. foot. Considering now that 6. the length of the Staffe containeth 3. threes, therefore the longitude desired, a. b. of spaces must contain three times the Staffe (which Staffe is 6. foot) that maketh 18. foot. As this is proved true by small ground in the figure following: so the art faileth not in a greater space, which the good Speculator and diligent

The cause is  
taken out of  
Euclid 33 pro.  
1 Book and  
the 4. pro. 6.  
Book.



gent Practiser by any way cannot deny. Yet experience willethe me this to confesse, that the Squire is not convenient for any long distance, but the instrument geometricall (whose making and use ye may perceiue in the treatise following) unless ye ascend some tree or curret for your aid, which length known, shall stand in stead of your Staffe.



### A Note.

**I**t behoeth you to haue a fine cord, made fast in the upper part of your Staffe, c. which shall be tyed even with the inwards edge of the Squire, and so drawn to the ground, where the nether end of the Squire from the Staffe pointed, as ye see d. c. the other end then truly directting to the furthest distance.

Knowe that the ground must be very plain and leuell, otherwise erre; ensueth.

Thus the use of the Squire is here somewhat declared, but more in my general Prognostication, yea most plentifully here, after (God sparing life) in a booke titled, The rare use of the Squire in practises Mathematicall. In the which booke profitable pleasant experiences shall be plainly opened (onely of me practised) as well of perspective, as of the Mathematicalls in generall.



A little Treatise, declaring the making  
and use of an Instrument Geometricall,  
so farre as it furthereth the Land-  
meater or Carpenter, named the  
profitable Staffe.

*To the Reader.*



Said in the beginning, that no little Book  
would contain the making and manifold  
fruits of this princely instrument, if it were set  
forth as it ought to be in his perfection. Certes  
the truth even here maketh me confess the  
same: yea that there is no Instrument so gene-  
rall and profitably pleasant: Notwithstand-  
ing know (Gentle READER) that the occasion of his chief  
use and profit is not here ministred: neither, to say the truth,  
doth it appertain to, or agree with the capacity of such Arti-  
ficers: Therefore I shall leave to intreat of his ample large use  
and best making, and will set him forth in few words: Yea suffi-  
ciently for the Land-meaters capacitee or Carpenters purpose,  
that at the least, they may receive some kinde of fruit with  
the Geometer. And in time to come (by other means) as I  
see cause, I will largely declare, and there deck him with his  
proper beauties. Here now followeth the making, and  
so briefly, how he is applied for the profit of the  
aforenamed Artificers.

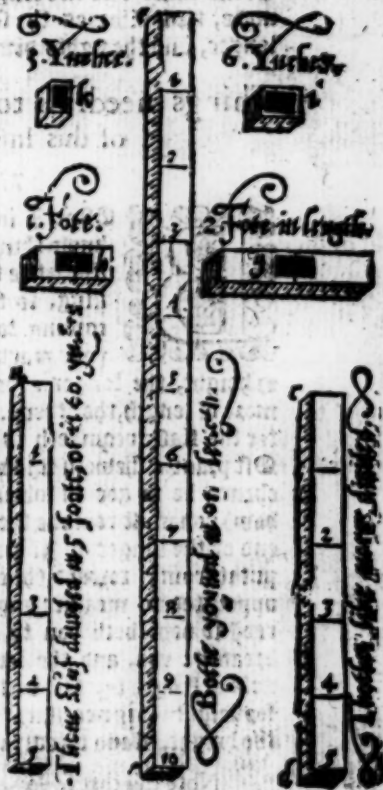
The

## The making of this profitable

### Rodde or Staffe.



Y<sup>e</sup> shall prepare first  
small, straight, stiff,  
rodd, or rather square  
rodde of metall or of  
wood, well plained, of  
like bigness and length. Although  
it make no matter of what length,  
yet to avoid the errors, which  
little instruments, and short staves  
bring, and also to beare with the  
rude untwisted handling of such  
Artificers: let our Rodde be each  
fve, or at least three foot, and  
every foot divided in twelve even  
parts or inches, as ye see a. b. and  
c. d. These Rods must be forged  
with a Tice in the end of them, so  
loyn readye, tenne or six foot in  
length. (when time requireth) as  
the figures e. f. sheweth. Also ye  
must get (by the help of some  
Craftsman) four other like Rods,  
the longer g. i. foot: the next h.  
i. foot: the other i. 6. inches, then  
k. 3. inches, the last and shortest  
l. 1. inch, and  $\frac{1}{2}$ . Each of these must  
have in their midst a hole, that  
the long staffe of ten foot may be  
put through them, and they moved  
on him at pleasure up and down, alwayes cutting the longer  
staffe c. f. squerwise, and made to carry on any division,



as occasion shall be given: which all are easily to be perceived by the figures following, although my rude declaration hath not expressed my meaning.

Here note in the head of your short staves, ye may have one Crosse-staffe two foot long, with currant sights; so artificially made, that alwayes the short staffe shall rim square upon the longer, and the sights distant, as ye list to place them.

Things needfull to be known before the use of this Instrument is opened.

The iij. Chapter.

**B**

Cloze I intreat of this life, it behoveth to know things necessary, and first, which of the five little staves g. h. i. k. l. mentioned in the making, is to be put on your long staffe e. f. according to the distance of the mark: Note if your mark be near hand, be it length, breadth, or height, the longer g. doth seem meetest to have the room, if more of length, the other h. and to the further distance, the shorter the staffe requireth to be: which shall be ample that place. It praiseth sheweth this better than many words. Also note, if chance be to goe in toward your mark, (as after you shall see how) you must remove the short staffe inward more near to the end of the longer e. If you be compelled to goe from it, then put it from e. toward the end f. Also remember when you are appointed to measure any breadth, or length, (as shall be declared) it behoveth you to stand right with, and against that breadth: yea, and the longer the breadth, or larger the wideness, or length is, the better the thing will come to pass. And for heights it is necessary if you regard all preciseness to have the height, stand directly up, and

Note this that followeth to be generall in all workings.

**Y**e must stand right up, with your Body and backe, your feet fast together, your hands not much moving, the one eye

eye closed, and ever mark your standing right with the midst  
of point *F*. Be not ignorant here, that I call the extreame of  
the little Staffe, the very end where the sight ever runneth,  
And no difference between the Altitude and height, between  
the longitude and length: the latitude and breadth. The short  
Staffe I name the lesser figured over them. Your eye must e-

What these  
words mean,  
Longitude,  
Latitude,  
Altitude.

ver be placed in the end of the longer Staffe *a*, and with the o-  
ther eye ye ought to wink.

These trilles and such like omission, lasteth the truth to

come to passe, and make men to suspect the ground, which is  
most certain.

How heights standing directly up, are  
measured by the Instrument.

The iii. Chapter.



At the Staffe *g* upon the longer *e. f.* and move  
your eye his full length from the beginning of the  
longer *e.* turn the end of *g.* forthward, and  
according to that height placing your eye (as  
is said) ever at the beginning of the longer *e.*  
with the other eye wink. When you have backun-  
till ye may plainly perceive the very upper part of that alti-  
tude, and also the lower end be the extremities of your shorter  
Staffe *g.* Now the space of the altitude of your Staffe in the back of  
the height is equal with the altitude of any other thing.

Or thus. When ye shall see any altitude, whose measure ye require,  
Imagine ye conceive how oftentimes that height is found  
in the space from it unto your standing. When ye have your  
shorter Staffe chosen as above most convenient, then as  
often his own length from the beginning of the longer *e.*



## The use of the

where your eye is eber placed: This done, turn the ends of your little staffe, your eye being in *e*. according to the height: look together: ye may see by the extremes of your staffe the very top, and also the lowest part of the height. If not, move the staffe a length further toward *e*. or neer to *e*. as ye see cause, and as your conjecture failed. So let your little staffe remain, as by conjecture he was put, and goe toward *a* from that height, untill the altitude agree justly with the extremes of your staffe. Then mark that place with the middest of your foot.

Nowe we may conclude, that the height is as often contained in the distance, which is between the mark and it, as the length of that little staffe is found removed from the end of the longer, &c.

### Ensample.

How he just  
height is  
known.

If the short staffe be ten times his own length from *e*. assure the height contained in that distance ten times only.

The altitude is thus gotten. Move your short staffe from his late being a length either toward or from *e*. as ye list to goe in or back. Then goe feet or neer unto it (as before) untill the very summitie, and also the lowest part of the height agree with the extremes of your short staffe. The space then between your marked place and this latter, declareth the just height. At times through impediments, ye shall not have room to goe so farre back or forward, as the height cometh unto. This remedy is provided. Move the little staffe half his length, and so seek two stations (as before) untill the extremes of the short staffe be found justly to answer either end of the height. Then the space between the two standings must be doubled, to have the just height: as if you list, ye may move the staffe, according to the fourth part of his length, or to any portion, as to the first, sixt, twenty, &c. then shall ye have that part of the height between the two stations.

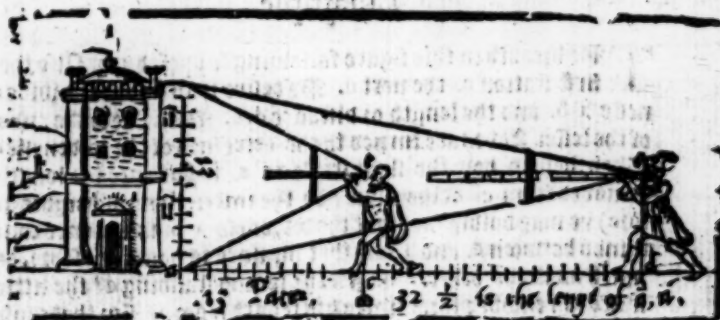
A remedy provided for want of ground.

Yet know this (which experience by diligent practise will shew) the bigger parts ye take, the less error ye commit. A little error often multiplied, increaseth to a great.

Now that all the aforespoken may the better be perceived, behold the example ensuing, as ye may see by figure declared, in the which the height is imagined a. b. the first station c. the short staffe g. is moved from e. just his length. I am forced to conclude, that the base of the height a. b. is from my standing e. even his precise length. So then if you measure that distance of a. c. being 13. paces, ye have the true height of a. b. as many. In the other standing place d. the shortest staffe is found from e. twice his length and a half, wherefore I must affirm the height a. b. to be contained 3 times in the distance a. d. twice and a half: which length a. d. is apparent 32 paces. All this that is spoken of the height, may well be understood of latitudes of widenesses and lengths following.

The ground of this may be gathered of Euclide in his perspective. 11. Theo.

In altitudes this rule is not perfect, except the eye be level with the middle of the altitude.



**R** How the breadth or wideness of things are found, and by them, length or any distance at pleasure.

The .iiii. Chapter.

**W**hatsoever I have instructed afore of heights, the same understand here of wideness, lengths, &c. For none otherwise are latitudes or widenesses searched by this Instrument, then before is declared of heights, only this excepted, that the short staffe must be contrary, the ends according to the breadth, seeing by the extremes of the short staffe, the very uttermost parts or ends of the latitude, noting your stations right with the middle of your foot, and so perform all as tofore. And as I said, thereof the parts of the height found betwixen your standings, even the same things is well used here, for all manner parts of the breadth.

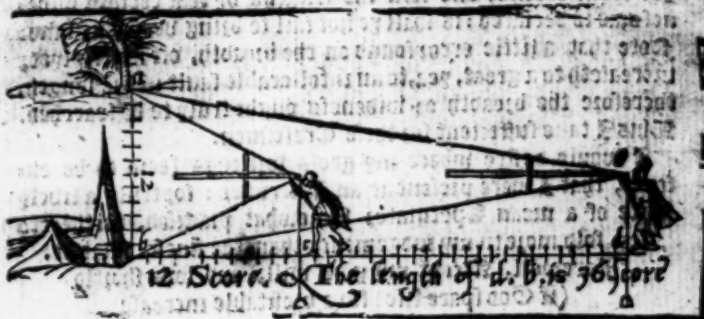
Example.

**T**he breadth in this figure following supposed a. b. Also the first station c. the next d. My desire is to know the wideness a. b. and the length or distance d. b. Marke how the ends of the lesser staves are turned to the extremes of the wideness. Then behold how the short staffe in c. is but once his length removed from c. Wherefore (by the instructions of heights afore) ye may boldly say, that the wideness a. b. is but once contained between d. and b. and that measure is found 12. scoze, as much as is the other a. b. In the second standing d. the little staffe is removed three times his length from c. For that cause I conclude (and truly) from b. to that station three times the breadth, which breadth is 12. scoze. So by the wideness I have found the length of b. d. 36. scoze, my desire. Thus are latitudes found, and by them lengths, &c.

# profitable Staffe.

## Behold the Figure.

Ye must alwaies stand directly against the  
middle of the breadth.



Whensoever any distance is put, whose certain length ye require: measure (by the staff expressed) either the height of any thing there found, or the breadth, and see how oftentimes that wideness or length is contained unto your standing; which known, the length cannot be hid; as is declared.

**N**ow in few words to conclude, ye may by this Instrument measure the distance of Houses, Steeples Trees, the length of Wallles, and breadth of Ditches, Images in height, and such like. The good wittie Carpenter standing in a place, where he may plainly see a whole House, or any manner of Frame with great pleasure, may by this get speedily the true proportion of that House, which he ought to note in a table, and when time cometh (not without his great praise) may make, reare, and set up the like. This I take to be sufficient for these Craftsmen.

A more larger  
use of this In-  
strument;

I have

# The use of this, &c.

I have before forgotten to admonish you whensoever ye list to measure any land exactly, by the Instrument Geometrical, named the Portable Staffe, to set upright a Rod, the length of a perch; Or the distance he long to passe out, or rather inky me! And so more perches, as the use is used of your length, the extremes noted with two visible marks. Then goe from thence, and seek the lengths by that certain widthness, as is declared: To wail ye not fall to bring very true laws. Note that a little error found on the breadth, or width, pleth, increaseth to a great, yea, to an intollerable fault in the length, therefore the breadth or widthness ought truly to be leaved. This I take sufficient for these Crafts-men.

I would desire where my gross writings seem to be obscure, that I were present as an Instruer: for truly a libell of a mean Speculator, somewhat pacifick, furthereth, yett sold more in my judgement, than the finest of letters. Farewell. Accept my good will, and take thought (if God spare life) for a profitable increase of these matters.





